What Is Claimed Is:

1. A magnetoresistive sensor element having a magnetoresistive layer system (10) which, in top view, is at least regionally striated, operates on the basis of the GMR effect and is constructed according to the spin valve principle; the striated layer system (10) featuring a reference layer (35) having a direction of magnetization approximately uninfluenced by a direction of an outer magnetic field acting on it; and during operation, the sensor element (5) providing a measuring signal which changes as a function of a measurement angle between the component of the field strength of the outer magnetic field, said component lying in the plane of the layer system (10), and the direction of magnetization of the reference layer (35), and from which this measurement angle is able to be ascertained,
wherein, observed in a top view of the striated layer system (10), the angle between the direction of magnetization of the reference layer (35) in the absence of the outer magnetic field and the longitudinal direction of the striated layer system (10) is set in such a way that, in response to an influence of the outer magnetic field having a defined field strength, which is selected from a predefined work interval, the angle error of the layer system (10) as a function of this angle and the field strength is at least approximately minimal; the angle error being defined as the maximum difference of the angle between the component of the field strength of the outer magnetic field lying in the plane of the layer system (10), and the direction of magnetization of the reference layer (35) given a negligibly weak outer magnetic field, and the measurement angle, ascertainable from the measuring signal, between the component, lying in the plane of the layer system (10), of the field strength of the outer magnetic field over all possible directions of the outer

magnetic field and the direction of magnetization of the reference layer (35).

2. The magnetoresistive sensor element as recited in Claim 1,
wherein, observed in a top view of the striated layer system (10), the angle between the direction of magnetization of the reference layer (35) in the absence of the outer magnetic field and the longitudinal direction of the striated layer system (10), as well as the width of the striated layer system (10) are adjusted so that they are matched to one another in such a way that, in response to an influence of the outer magnetic field having a defined field strength, which is selected from a predefined work interval, the angle error of the layer system (10) as a function of this angle, the field strength and the width of the layer system (10) is at least approximately minimal.

3. The magnetoresistive sensor element as recited in Claim 1 or 2,
wherein the field strength of the outer magnetic field is selected from the work interval of 0.8 kA/m to 80 kA/m, particularly 8 kA/m to 30 kA/m, and the angle between the direction of magnetization of the reference layer (35) in the absence of the outer magnetic field, and the longitudinal direction of the striated layer system (10) is at least approximately 0° or 90° or 180° or 270°.

4. The magnetoresistive layer system as recited in one of the preceding claims,
wherein the width of the striated layer system (10) is selected from the interval from 1 μm to 100 μm, particularly 2 μm to 30 μm.

5. The magnetoresistive layer system as recited in one of the preceding claims,
wherein the striated layer system (10) features an artificial anti-ferromagnet (40) having a first fixed layer (35) and a second fixed layer (33) which are separated from each other via an intermediate layer (34), the reference layer (35) being the first fixed layer (35).

6. The magnetoresistive layer system as recited in one of the preceding claims,
wherein the first fixed layer (35) is made of a first ferromagnetic material, particularly a CoFe alloy, and the second fixed layer (33) is made of a second ferromagnetic material, particularly a CoFe alloy, and the intermediate layer (34) is made of a non-magnetic material, particularly ruthenium.

7. The magnetoresistive layer system as recited in Claim 6, wherein the thickness of the first fixed layer (35) is less, particularly 0.2 nm to 0.8 nm less, than the thickness of the second fixed layer (33).

8. The magnetoresistive layer system as recited in one of the preceding claims,
wherein the second fixed layer (33) is adjacent to an anti-ferromagnetic layer (32), particularly a layer made of a PtMn alloy.

9. The magnetoresistive layer system as recited in one of the preceding claims,
wherein the first fixed layer (35) is adjacent to a metallic layer (36) made particularly of copper, and the metallic layer (36) is adjacent to a detection layer (41) that has a magnetization whose direction is always at least approximately parallel to the direction of the component of the field

strength of the outer magnetic field, said component lying in the plane of the layer system (10).

10. The magnetoresistive layer system as recited in Claim 9, wherein the detection layer (41) is made up of at least two sublayers (37, 38), a first sublayer (37) adjacent to the metallic layer (36) being made of a CoFe alloy, and a second sublayer (38) being made of a NiFe alloy.

11. The magnetoresistive layer system as recited in one of the preceding claims,
wherein the anti-ferromagnetic layer (32) has a thickness of 20 nm to 40 nm, especially 30 nm; the second fixed layer (33) has a thickness of 2 nm to 4 nm, especially 2.4 nm; the intermediate layer (34) has a thickness of 0.6 nm to 0.8 nm, especially
0.7 nm; the first fixed layer (35) has a thickness of 1 nm to 3.5 nm, especially 2 nm; the metallic layer (36) has a thickness of 1 nm to 4 nm, especially 2 nm; the first sublayer (37) has a thickness of 0.5 nm to 2 nm, especially 1 nm; and the second sublayer (38) has a thickness of 1.5 nm to 5 nm, especially
3 nm.

12. The magnetoresistive layer system as recited in one of the preceding claims,
wherein in top view, the striated layer system (10) takes the form of a meander having strip sections running regionally in parallel, the directions of magnetization of the reference layers (35) of the strip sections being oriented at least approximately parallel to one another.

13. The magnetoresistive layer system as recited in Claim 12, wherein the striated layer system (10) has strip parts which regionally run not in parallel with, but, in particular, perpendicularly with respect to the strip sections, and a

conducting layer (11) exhibiting good electrical conductivity, particularly a coating made of aluminum, is provided which runs in parallel, especially on or below these strip parts and at least approximately electrically short-circuits or bridges them, or the strip parts are formed from a material exhibiting good electrical conductivity, especially aluminum.

14. A method for reducing the angle error of a magnetoresistive sensor element, in particular as recited in one of the preceding claims, having a magnetoresistive layer system (10) which, in top view, is at least regionally striated, operates on the basis of the GMR effect and is constructed according to the spin valve principle; the striated layer system (10) featuring a reference layer (35) having a direction of magnetization approximately uninfluenced by a direction of an outer magnetic field acting on it; and during operation, the sensor element (5) providing a measuring signal which changes as a function of a measurement angle between the component of the field strength of the outer magnetic field, said component lying in the plane of the layer system (10), and the direction of magnetization of the reference layer (35), and from which this measurement angle is able to be ascertained,
wherein, observed in a top view of the striated layer system (10), the angle between the direction of magnetization of the reference layer (35) in the absence of the outer magnetic field and the longitudinal direction of the striated layer system (10) is set in such a way that, in response to an influence of the outer magnetic field having a defined field strength, which is selected from a predefined work interval, the angle error of the layer system (10) as a function of this angle and the field strength is at least approximately minimal; the angle error being defined as the maximum difference of the angle between the component of the field

strength of the outer magnetic field lying in the plane of the layer system (10), and the direction of magnetization of the reference layer (35) given a negligibly weak outer magnetic field, and the measurement angle, ascertainable from the measuring signal, between the component, lying in the plane of the layer system (10), of the field strength of the outer magnetic field over all possible directions of the outer magnetic field and the direction of magnetization of the reference layer (35).

15. The method as recited in Claim 14, wherein, observed in a top view of the striated layer system (10), the angle between the direction of magnetization of the reference layer (35) in the absence of the outer magnetic field and the longitudinal direction of the striated layer system (10), as well as the width of the striated layer system (10) are adjusted so that they are matched to one another in such a way that, in response to an influence of the outer magnetic field having a defined field strength, which is selected from a predefined work interval, the angle error of the layer system (10) as a function of this angle, the field strength and the width of the layer system (10) is at least approximately minimal.